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Earned Value in WorkLenz

Overview

Earned Value Management provides an industry standard and proven method for measuring project performance. Utilizing the schedule, budget and cost information gathered in a baseline, earned value measures project performance by comparing planned costs against the cost of work as it occurs. WorkLenz presents standard earned value performance metrics such as schedule performance index (SPI), schedule variance (SV), cost performance index (CPI) and cost variance (CV). These metrics, along with existing WorkLenz metrics of churn and performance ratio (PR), allow project and portfolio managers to understand project status and make intelligent decisions about work within their enterprise.

Baselines

The first step in capturing WorkLenz Earned Value metrics is creating a project baseline (Figure 1). A baseline represents the established schedule, budget and estimated costs associated with a project plan. When a project has reached a level of maturity in terms of planning, the project should be baselined, creating the initial budget from which Earned Value metrics are then calculated. The baseline should represent a contracted or approved scope of work that should only change intermittently over the life of the project. A project may be re-planned, and therefore, may be re-baselined after a new project plan is formulated. Project managers can use WorkLenz to create a baseline, re-plan a project, and access an archive of project baselines and actuals.

Figure 1

Calculations

All WorkLenz Earned Value calculations are consistent with ANSI Standard 748. In addition, WorkLenz calculations are also consistent with Microsoft Project calculations, allowing project managers to take full advantage of WorkLenz import capability from Microsoft Project while maintaining consistency across metric calculations and complying with federal regulations.

Earned Value calculations in WorkLenz are aggregated from the task level and can be calculated from both labor and non-labor costs. Earned Value calculations for labor costs are based upon task percent complete. This field is updated manually in WorkLenz, giving the user the flexibility to status tasks and projects appropriately. Earned value calculations for non-labor costs are based on information collected in task expenses. For a more detailed description of WorkLenz Earned Value calculations, see Appendix A.

Summary Screen Metrics

Earned Value metrics are displayed on the portfolio, program, project and phase summary screens in WorkLenz (Figure 2). The CPI and SPI are statused in real time as users complete tasks in WorkLenz. Project managers can use these standard Earned Value metrics in conjunction with the financial, effort, risk, churn, and forecast data presented on the summary screen. The ability to view all of these metrics in a central location allows managers to quickly and accurately assess the health of their organization and its projects.
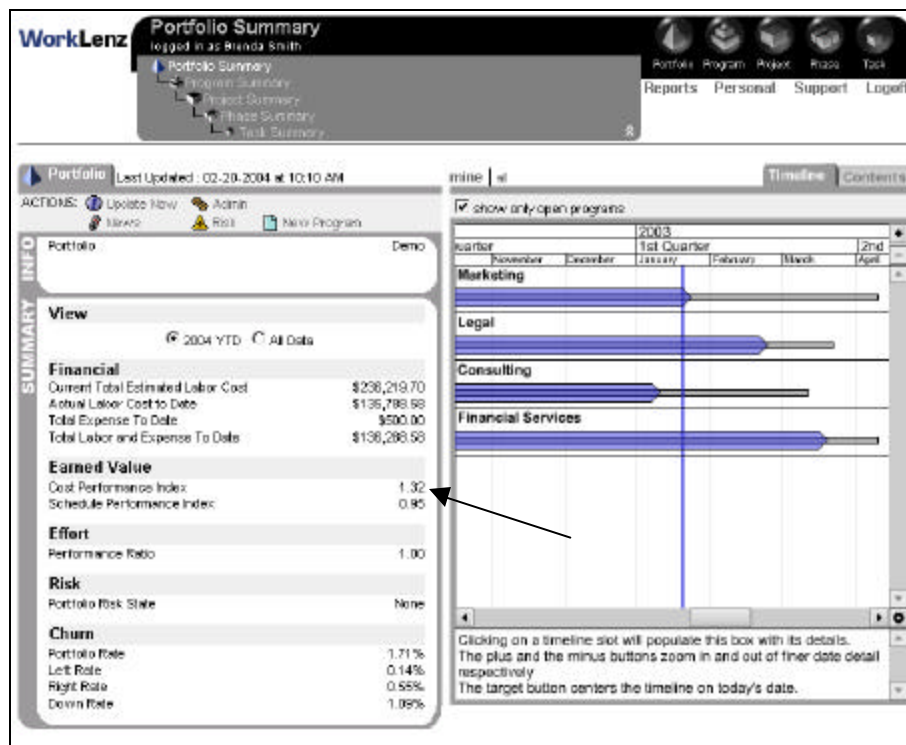

Figure 2

Earned Value Reports

A standard *Earned Value Report* (Figure 3) exists at all levels of WorkLenz (portfolio, program, project, phase and task). This report has a drill-down capability allowing the user to start at the portfolio level and navigate down through the project to evaluate the project and identify key areas for improvement. Earned Value metrics are calculated in real-time based on input information after a baseline is captured. Included in each report are detailed metrics for the selected level as well as a summary of the budget at complete (BAC), CPI, and SPI for the children of the selected parent level. This dynamic report enables project managers to make informed decisions and provide consistent management reporting.

Earned Value Report
Portfolio Level

Earned value

	Value
Baseline Date	Between 02-09-2004 And 02-23-2004
Budget At Complete (BAC)	$9,100.00
Actual Cost of Work Performed (ACWP)	$3,870.00
Budgeted Cost of Work Performed (BCWP)	$6,815.00
Budgeted Cost of Work Scheduled (BCWS)	$7,733.24
Cost Variance (CV)	$3,145.00
Cost Variance Percent (CV%)	46.15%
Cost Performance Index (CPI)	1.8569
Schedule Variance (SV)	-$918.24
Schedule Variance Percent (SV%)	-11.87%
Schedule Performance Index (SPI)	0.8813
Estimate At Complete (EAC)	$9,100.00
Variance At Complete (VAC)	$0.00
Variance At Complete Percent (VAC%)	0.00%
Expected Completion Amount (ECA)	$5,430.00

Programs

	BAC	CPI	SPI

Figure 3

Conclusion

WorkLenz provides project managers with metrics and analysis that enhance decision-making, provide insight into processes, and drive efficiency gains. Earned Value is a standard industry methodology that provides project performance measurement. WorkLenz incorporates Earned Value at the portfolio, program, project, phase, and task levels and provides a standard drill-down report to ensure comprehensive analysis across an organization. The unique combination of Earned Value, churn, performance, and forecast metrics in WorkLenz provides analysis of past performance and insight into future work performance.

Appendix A

WorkLenz Earned Value Calculations

WorkLenz Earned Value calculations can be based on either labor and material costs or labor costs only. This preference is set for the entire portfolio during initial implementation, although the preference may be changed at the portfolio level. This preference will determine what types of costs are reflected in the WorkLenz Earned Value calculations.

Labor and Material Calculations
The metrics outlined below are the Earned Value metrics used in the WorkLenz *Earned Value Report* (Figure 3) when the portfolio preference for Earned Value calculations is set to include task expenses. The calculations are defined for the task level and aggregated at the phase, project, program, and portfolio.

Budget At Complete (BAC) is the sum of all budgets for a project.

BAC = (baselined estimated hours assigned at the task level * individual resource cost)
      + sum (baselined estimated expense amounts for the task)

Actual Cost of Work Performed (ACWP) is the cost actually incurred for a project to-date.

ACWP = (actual hours incurred at the task level * individual resource cost)
      + sum (actual expenses amounts for the task)

Budgeted Cost of Work Performed (BCWP) is the sum of the budgets for completed work in a project to-date.

BCWP = (task % complete * baselined estimated hours * individual resource cost)
      + task % complete * sum (baselined estimated expense amounts for the task)

Budgeted Cost of Work Scheduled (BCWS) is the sum of all budgets for work scheduled to be accomplished to-date.

BCWS = (BAC at the task level / total work days baselined * work days to-date)
      + sum (baselined estimated expense amounts * work days to-date / total work days
      baselined)

Cost Variance (CV) is the difference between the budgeted and actual cost of work performed.

CV = BCWP - ACWP

Cost Performance Index (CPI) is the cost efficiency ratio of earned value to actual costs.

CPI = BCWP / ACWP

Schedule Variance (SV) is the difference between the budgeted cost of work performed and work scheduled.

SV = BCWP - BCWS

Schedule Performance Index (SPI) is the ratio of earned value to work scheduled.

SPI = BCWP / BCWS

Estimate At Complete (EAC) is the actual costs incurred plus the estimate of costs for authorized work remaining for a project.

EAC = estimated hours assigned at the task level * individual resource cost
**EAC Best Case = ACWP + (BAC – BCWP) / CPI
**EAC Worst Case = ACWP + (BAC – BCWP) / (CPI * SPI)

Variance At Complete (VAC) is the difference between the budgeted and estimated cost at completion of a project.

VAC = BAC – EAC
**VAC Best Case = BAC – EAC Best Case
**VAC Worst Case = BAC – EAC Worst Case

Expected Completion Amount (ECA) is the difference between the estimate cost at the completion of a project and the actual cost of work performed.

ECA = EAC – ACWP

Schedule Variance Percent (SV %) is the percent difference between the budgeted cost of work performed and work scheduled.

SV % = (BCWP – BCWS) / BCWS

Cost Variance Percent (CV %) is the percent difference between the budgeted and actual cost of work performed.

CV % = (BCWP – ACWP) / BCWP

Labor Costs Only Calculations

The metrics outlined below are the Earned Value metrics used in the WorkLenz *Earned Value Report* (Figure 3) when the portfolio preference for Earned Value calculations is set to include only labor costs. The calculations are defined for the task level and aggregated at the phase, project, program, and portfolio.

Budget At Complete (BAC) is the sum of all budgets for a project.

BAC = baselined estimated hours assigned at the task level * individual resource cost

Actual Cost of Work Performed (ACWP) is the cost actually incurred for a project to-date.

ACWP = actual hours incurred at the task level * individual resource cost

Budgeted Cost of Work Performed (BCWP) is the sum of the budgets for completed work in a project to-date.

BCWP = task % complete * baselined estimated hours * individual resource cost

Budgeted Cost of Work Scheduled (BCWS) is the sum of all budgets for work scheduled to be accomplished to-date.

BCWS = BAC at the task level / total work days baselined * work days to-date

Cost Variance (CV) is the difference between the budgeted and actual cost of work performed.

CV = BCWP - ACWP

Cost Performance Index (CPI) is the cost efficiency ratio of earned value to actual costs.

CPI = BCWP / ACWP

Schedule Variance (SV) is the difference between the budgeted cost of work performed and work scheduled.

SV = BCWP - BCWS

Schedule Performance Index (SPI) is the ratio of earned value to work scheduled.

SPI = BCWP / BCWS

Estimate At Complete (EAC) is the actual costs incurred plus the estimate of costs for authorized work remaining for a project.

EAC = estimated hours assigned at the task level * individual resource cost
**EAC Best Case = ACWP + (BAC – BCWP) / CPI
**EAC Worst Case = ACWP + (BAC – BCWP / (CPI * SPI)

Variance At Complete (VAC) is the difference between the budgeted and estimated cost at completion of a project.

VAC = BAC – EAC
**VAC Best Case = BAC – EAC Best Case
**VAC Worst Case = BAC – EAC Worst Case

Expected Completion Amount (ECA) is the difference between the estimate cost at the completion of a project and the actual cost of work performed.

ECA = EAC – ACWP

** Best and Worst Case calculations are included in the *OMB-Specific Earned Value Report* available for government clients.